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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation	)	ET Docket No. 93-62
	)	

To: The Commission

COMMENTS

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COMMENTS

BellSouth Corporation, BellSouth Telecommunications, Inc., BellSouth Enterprises, Inc., and BellSouth Cellular Corp. (collectively, "BellSouth"), by their attorneys, hereby submit these Comments in response to the Commission's *Notice of Proposed Rulemaking* in ET Docket 93-62.[1/]

SUMMARY

BellSouth supports the Commission's proposal to adopt the 1992 ANSI/IEEE standard[2/] for evaluating the environmental effects of radio frequency ("RF") radiation. The Commission has sought IEEE clarification about extending the low-power hand-held device exclusion to the 2 GHz band. BellSouth supports this effort, which will expedite compliance with the standard by future PCS providers. A similar clarification should be sought regarding the time-averaging criteria. In addition, the Commission should consider adopting a limited categorical exclusion for certain land mobile base station equipment. Finally, BellSouth suggests that the Commission should establish a program for recognition of qualified RF radiation testing laboratories.

1/ *Notice of Proposed Rulemaking*, 8 FCC Rcd. 2849 (1993) (NPRM), *summarized*, 58 Fed. Reg. 19,393 (1993).

2/ ANSI/IEEE C95.1-1992, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields" (approved Sept. 26, 1991 by IEEE and Nov. 18, 1992 by ANSI).

DISCUSSION

I. BELLSOUTH SUPPORTS ADOPTION OF THE 1992 ANSI/IEEE STANDARD, WITH CLARIFICATIONS

BellSouth agrees that the Commission should adopt the 1992 ANSI/IEEE standard on the environmental effects of RF radiation. The Commission currently uses the ANSI C95.1-1982 standard,[3/] which dates from 1982,[4/] for determining whether authorization of a given facility will constitute a "major action" requiring an Environmental Assessment.[5/]

In the past eleven years, there has been considerable research into RF environmental effects. The 1992 ANSI/IEEE standard establishes guidelines for RF exposure that are based on this growing body of scientific data. BellSouth supports the Commission's efforts to bring its RF environmental processing into line with the advances in scientific knowledge in this area.

The use of scientifically-based criteria for evaluating the environmental effects of RF radiation will serve the public interest by minimizing potential hazards. Equally important, it will give the telecommunications industry, workers, and the general public grounds for confidence in the safety of FCC-licensed facilities.

3/ ANSI C95.1-1982, "American National Standard Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz."

4/ This standard was promulgated by ANSI in 1982 and adopted by the Commission in 1985. *Biological Effects of Radiofrequency Radiation*, Gen. Docket 79-144, *Report and Order*, 100 FCC 2d 543; *Memorandum Opinion and Order*, 50 Fed. Reg. 38,653, 58 RR 2d 1128 (1985).

5/ *See* 47 C.F.R. 1.1307(b). The Commission's rules categorically exempt several services, including the cellular, paging, and private land mobile services, from making a determination of compliance with the ANSI standard, because "there is little likelihood for the identified transmitting facilities to cause exposures in excess of the RF safety guidelines." *Biological Effects of Radiofrequency Radiation*, Gen. Docket 79-144, *Second Report and Order*, 2 FCC Rcd. 2064, 2065 (1987); *see* 47 C.F.R. § 1.307(b) Note 1.

Accordingly, BellSouth supports the adoption of the 1992 ANSI/IEEE standard. BellSouth also believes that there are two areas in which the standard should be clarified, as described in the following sections.

A. BellSouth Supports Commission Efforts to Extend the Low-Power Exclusion Beyond 1500 MHz To the 2 GHz PCS Bands

The standard establishes guidelines for the maximum permissible exposure ("MPE") to electromagnetic fields that cover nine frequency bands from 3 kHz to 300 GHz for both "controlled" and "uncontrolled" environments.[6/] The standard also provides exclusions from the MPE guidelines for both types of environments in two circumstances: (1) when laboratory tests show that the exposure does not exceed a certain specific absorption rate ("SAR");[7/] and (2) for "low power devices," such as "'hand-held, mobile, and marine radio transceivers,'"[8/] whose radiated power does not exceed a specified level.

The current (1982) standard provides an exclusion for low-power devices with an RF input power of seven watts or less.[9/] The 1992 ANSI/IEEE standard provides an

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6/ Controlled environments are "'locations where there is exposure that may be incurred by persons who are aware of the potential for exposure as a concomitant of employment, by other cognizant persons, or as the incidental result of transient passage through areas where analysis shows the exposure levels may be above [the exposure and induced current levels but not those permitted for persons aware of the potential for exposure].'" NPRM, 8 FCC Rcd. at 2850-51, *quoting* ANSI/IEEE C95.1-1992. Uncontrolled environments are "'locations where there is the exposure of individuals who have no knowledge or control of their exposure. The exposures may occur in living quarters or workplaces where there are no expectations that the exposure levels may exceed [the exposure and induced current levels permitted for the general public].'" 8 FCC Rcd. at 2851.

7/ Specific absorption rate is defined as "[t]he time rate at which radio frequency electromagnetic energy is imparted to an element of mass of a biological body." ANSI C95.1-1982, Definitions, *excerpted in* NPRM, Appendix A, 8 FCC Rcd. at 2855.

8/ NPRM, 8 FCC Rcd. at 2851, *quoting* ANSI/IEEE C95.1-1992, Section 5.

9/ *Id.*

exclusion for low-power devices in uncontrolled environments that covers devices at frequencies between 450 and 1500 MHz whose radiated power is limited to 1.4(450/f) watts, where f is the frequency in MHz, as long as the radiating structure is maintained at least 2.5 cm from the body.[10/] The 1992 ANSI/IEEE standard does not, however, provide any specific exclusion for low-power mobile or portable units operating above 1500 MHz. Thus, there is no exclusion that specifically addresses the low-power units that will be used by customers in 2 GHz PCS networks.

The Commission has sought a formal interpretation from the IEEE as to whether the radiated power exclusion can be extrapolated to the 2 GHz range that will be used for PCS.[11/] BellSouth strongly supports this effort to establish objective exclusion criteria. As the Commission has stated:

> Such an extrapolation could make compliance with the ANSI/IEEE criteria less burdensome for manufacturers. In the meantime, compliance with the guidelines can be demonstrated by determination of maximum specific absorption rates (SAR) associated with specific hand-held devices.[12/]

If such clarification cannot be obtained promptly, however, BellSouth urges the Commission not to allow its adoption of the ANSI/IEEE standard to be delayed.[13/]

10/ *Id.* at 2851, 2861.

11/ Letter from Thomas P. Stanley, Chief Engineer, to Andrew G. Salem, Secretary, IEEE Standards Board, dated June 2, 1993; *see New Personal Communications Services*, Gen. Docket 90-314, *Second Report and Order*, FCC 93-451 at ¶ 192 & n. 139 (Oct. 22, 1993).

12/ *Second Report and Order* at ¶ 192.

13/ PCS equipment manufacturers may initially have to conduct SAR measurements if the low-power exclusion is not extended to the 2 GHz band at the outset, but the development, type-acceptance, and production of the initial PCS equipment is not likely to be delayed significantly. The exclusion will be of considerable importance, however, in several years, when PCS networks are operational. At that time, the equipment market is likely to be highly competitive, marketing to cost-conscious consumers, and it will be very important to eliminate any unnecessary expense if the PCS market's potential is to be realized.

B. The Applicability of Time Averaging Standards for the Low Power Exclusion Should be Clarified

The incident power guidelines in the 1992 ANSI/IEEE standard prescribe the length of time to be used for time-averaging of measurements. The table of time-averaging durations is also referenced in the criteria for exclusion based on SAR measurements. There is, however, no reference to time-averaging in the low-power exclusion criteria.[14/] However, time-averaging should be equally appropriate for the low-power exclusion. The likelihood of absorption of RF energy by human tissue is the basis for the low-power exclusion as well as the MPE and SAR criteria.

Time-averaging may have significant effects on the outcome of testing, based on the percentage of time a given unit is transmitting during the test period.[15/] BellSouth believes it would be appropriate to utilize time averaging in determining whether the power level of a unit meets the low-power exclusion. In the event this is not the case, highly efficient equipment utilizing time-slicing techniques may have to undergo SAR testing, because of the peak power utilized, even though its mean power level meets the low-power criteria. Accordingly, BellSouth urges the Commission to seek clarification from the IEEE on the applicability of time-averaging to the low-power exclusion criteria.

14/ *Compare* ANSI/IEEE C95.1-1992, Maximum Exposure for Uncontrolled Environments - Averaging Times for Maximum Permissible Exposure (uncontrolled environments) *and* Exclusions - Uncontrolled Environments *with* Exclusions - Low-Power Devices: Uncontrolled Environments, *excerpted in* NPRM at Appendix A, 8 FCC Rcd. at 2861.

15/ This is affected not only by the length of a given exchange of communications, but also by whether a two-way communications channel remains open during operation and the type of modulation. Many highly efficient modulation techniques utilize one or another form of time-slicing, as in time division multiple access ("TDMA") and time division multiplexing ("TDM"). These techniques, which are frequently used in conjunction with digital transmissions, such as digital TDMA cellular service, result in a mean power level that is considerably lower than peak power.

II. THE FCC SHOULD ESTABLISH A PROGRAM FOR RECOGNITION OF QUALIFIED TESTING LABORATORIES

Equipment not qualifying for the low-power exclusion may be excluded from complying with the MPE guidelines if it satisfies the SAR criteria contained in the 1992 ANSI/IEEE standard.[16/] In the cellular frequency band, most portable handsets would qualify for the low-power exclusion.

Most mobile units and some transportable units, however, operate at higher power levels, and they would therefore not qualify for the low-power exclusion.[17/] Moreover, PCS subscriber equipment would not qualify for the low-power exclusion, unless the frequency range for the exclusion were extended to cover the 2 GHz band, as BellSouth suggests in the preceding section. Thus, to the extent such subscriber equipment is not

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16/ Specifically, for uncontrolled environments, the standard permits the MPE to be exceeded if:

> (a) the exposure conditions can be shown by appropriate techniques to produce SARs below 0.08 W/kg as averaged over the whole-body and spatial peak SAR, not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube), except for the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube; and
>
> (b) the induced currents in the body conform with the MPE [for uncontrolled environments].

ANSI/IEEE C95.1-1992, Exclusions, *excerpted in* NPRM, Appendix A, 8 FCC Rcd. at 2861.

17/ Furthermore, the exclusion for low-power devices does not apply to devices whose radiating structure is "maintained within 2.5 cm of the body." *See* NPRM, Appendix A, 8 FCC Rcd. at 2861. This would not likely affect mobile units, whose radiating structure is externally mounted on a vehicle, or the larger models of cellular handsets. However, some portable land mobile equipment may not be designed to maintain a separation from the body exceeding this distance. Handsets radiating with 2.5 cm of the body would not be eligible for the low-power exclusion.

subject to a categorical exclusion, it would have to undergo testing for SAR compliance.[18/] The IEEE and ANSI have established criteria for such testing.[19/]

To ensure reliable test results, BellSouth urges the Commission to establish procedures for recognizing, certifying, or otherwise acknowledging the competence of laboratories capable of satisfying these testing criteria. This standardization would give the public a high degree of confidence in the safety of the equipment they use on an everyday basis.

III. CERTAIN LAND MOBILE FACILITIES SHOULD REMAIN CATEGORICALLY EXEMPTED FROM RF RADIATION ANALYSIS

The NPRM notes that certain of the services currently categorically excluded from the RF radiation analysis required by 47 C.F.R. § 1.1307(b) "may not be consistent with the provisions of the new 1992 ANSI/IEEE guidelines," potentially including "some land-mobile services, both common carrier and private."[20/] Accordingly, the Commission said it would review the categorical exclusions in light of the new guidelines and sought comment, information, and analysis relating to whether they should be continued. It also sought comment on whether any rules should be changed to ensure compliance with the guidelines, and on how affected facilities and operations could demonstrate compliance.[21/]

18/ Some relatively low-power devices may emit localized fields exceeding the MPE limits; such devices would have to meet either the low-power exclusion criteria or the SAR criteria. As discussed above, some mobile, transportable, or even portable subscriber equipment utilize power levels exceeding the limits for low-power exclusion. These would, therefore, have to be tested for SAR compliance.

19/ IEEE C95.3-1991 (also designated as ANSI/IEEE C95.3-1992), "Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields -- RF and Microwave."

20/ NPRM, 8 FCC Rcd. at 2852.

21/ *Id.*

BellSouth supports a partial continuation of the Part 22 and Part 90 exclusions. As the Commission recognized, "The majority of land-mobile transmitters will very likely comply with the ANSI/IEEE guidelines in most environments."[22/] At a minimum, the Commission should categorically exclude base station equipment meeting the standards established for hand-held devices. Given the fact that much of the base station equipment to be deployed in PCS networks (and even in parts of cellular networks) is designed for low-power, limited range microcellular operations, exempting base station equipment that meets the subscriber-handheld standards would be a reasonable way of minimizing the cost and maximizing the availability of such equipment.

In addition, the Commission should consider the adoption of objective criteria for exclusion of base station facilities exceeding the standard for hand-held equipment, if the equipment is located at a specified distance from areas accessible to the public.

Another issue to be considered is how the standards will be applied in the case of mobile or portable equipment, which is typically purchased by the customer at a retail outlet. The equipment may be used both on the customer's home system and on other systems as a roamer. The carrier providing service has no way to ensure that such equipment is installed so as to meet the standards. BellSouth urges the Commission to establish mandatory criteria for installation that would ensure compliance with the guidelines (or the SAR criteria), generically, and establish a categorical exclusion for such equipment. This could be accomplished through the type acceptance process, by requiring the party seeking type acceptance to establish installation specifications that will result in compliance with the guidelines.

22/ NPRM, Appendix B, 8 FCC Rcd. at 2861.

CONCLUSION

Accordingly, BellSouth supports adoption of the 1992 ANSI/IEEE standard. The Commission has properly sought to extend the low-power exclusion criteria to the 2 GHz PCS band; a similar clarification regarding time averaging criteria would serve the public interest as well. BellSouth also urges the Commission to establish limited categorical exclusions for certain land mobile base station equipment and to establish a program for recognizing laboratories qualified to conduct SAR testing.

Respectfully submitted,

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November 23, 1993

Certificate of Service

I, Mary Jane Adcock, hereby certify that on this 23rd day of November, 1993, copies of the foregoing "Comments" were hand delivered to the following:

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